MITSUBISHI ELECTRIC

SPLIT-TYPE, HEAT PUMP AIR CONDITIONERS

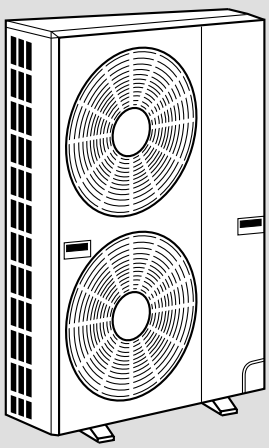
1999

No.OC184

TECHNICAL & SERVICE MANUAL

Outdoor unit
[Model names]
PUH-4VKSA

[Service Ref.]
PUH-4VKSA.UK



OUTDOOR UNIT

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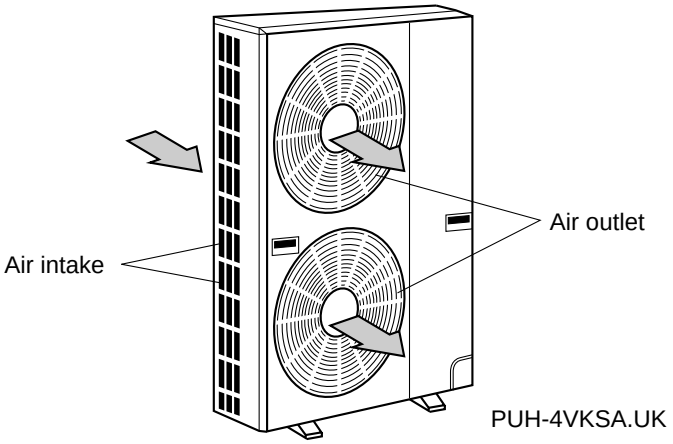
The Slim Line.
From Mitsubishi Electric.

Mr.SLIM™

1 PART NAMES AND FUNCTIONS



CHARGELESS SYSTEM
PRE-CHARGED REFRIGERANT IS SUPPLIED FOR UP TO 30m PIPING LENGTH AT SHIPMENT.

The unique refrigerant circuit and a large accumulator always control the optimal refrigerant level regardless of the length (50m max. and 5m min.) of piping. The additional refrigerant charging work during installation often causes problems. Therefore, it is completely eliminated. This unique system improves the quality and reliability of the work done. It also helps to speed up the installation work.

2 SPECIFICATIONS

OUTDOOR UNIT	**Service Ref.**			**PUH-4VKSA.UK**
	Power supply (phase, cycle, voltage)			Single, 50Hz, 220~240V
		Input	kW	3.52
		Running current	A	16.3
		Starting current	A	79
	External finish			Munsell 5Y 7/1
	Refrigerant control			Capillary tube
	Compressor			Hermetic
		Model		NH56VNDT
		Motor output	kW	2.7
		Starter type		Line start
		Protection devices		Internal thermostat, thermal switch, Hp switch
		Cranckcase heater		38
	Heat exchanger			Plate fin coil
		Fan(drive) × No.		Propeller (direct) ×2
		Fan motor output	kW	0.065+0.065
		Airflow	CMM	95
	Defrost method			Reverse cycle
	Noise level		dB(A)	54
	Dimensions	W	mm(in)	870(34-1/4)
		D	mm(in)	295+24 (11-5/8 add 1)
		H	mm(in)	1258(49-1/4)
	Weight		kg(lbs)	94(207)
REFRIGERANT PIPING	Refrigerant			R-22
		Charge	kg(lbs)	4.2(9.2)
		Oil (Model)	CC	1600 (MS-32)
	Pipe size O.D.	Liquid	mm(in)	9.52 (3/8)
		Gas	mm(in)	19.05(3/4)
	Connection method	Indoor side		Flared
		Outdoor side		Flared
	Between the indoor & outdoor unit	Height difference		Max. 50m
		Piping length		Max. 50m

Notes1. Rating Conditions (JIS B8616)
Cooling : Indoor :27°C(80°F)DB. 19°C(66°F)WB Outdoor :35°C(95°F)DB. 24°C(75°F)WB
Heating : Indoor :20°C(68°F)DB. Outdoor :7°C(45°F)DB. 6°C(43°F)WB
Refigerant piping length (one way) :5m (16ft)

2. Guaranteed operating range

		Indoor	Outdoor
Cooling	Upper limit	32°C DB, 23°C WB	43°C DB
	Lower limit	21°C DB, 15°C WB	-5°C DB
Heating	Upper limit	27°C DB	24°C DB, 18°C WB
	Lower limit	20°C DB	-5°C DB, -6°C WB

3. Above values are as follows.
Indoor Unit 1 phase 240V 50Hz
Outdoor Unit 1 phase 240V 50Hz

3 DATA

1. REFILLING REFRIGERANT CHARGE (R-22 : kg)

Service Ref.	Refrigerant pipimg length (one way)									
	5m	10m	15m	20m	25m	30m	35m	40m	45m	50m
PUH-4VKSA.UK	3.5	3.6	3.8	3.9	4.1	4.2	4.4	4.5	4.6	4.8

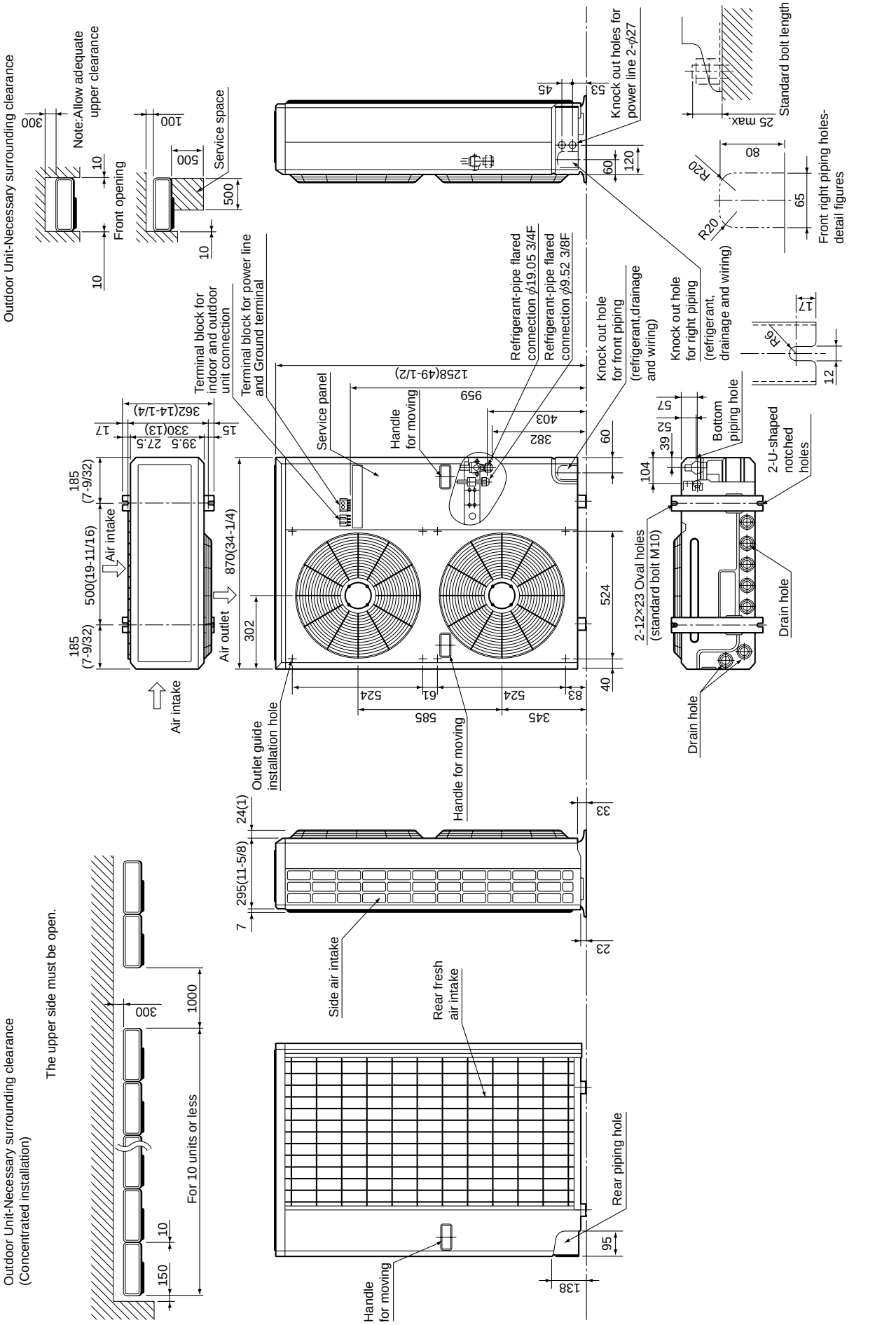
2. COMPRESSOR TECHNICAL DATA

Outdoor unit		**PUH-4VKSA.UK**
Compressor Model		NH56VNDT
Winding Resistance (Ω) at 20°C	U-V (R-C)	0.64
	U-W (R-C)	1.55
	W-V	—

4 OUTLINES AND DIMENSIONS

PUH-4VKSA·UK

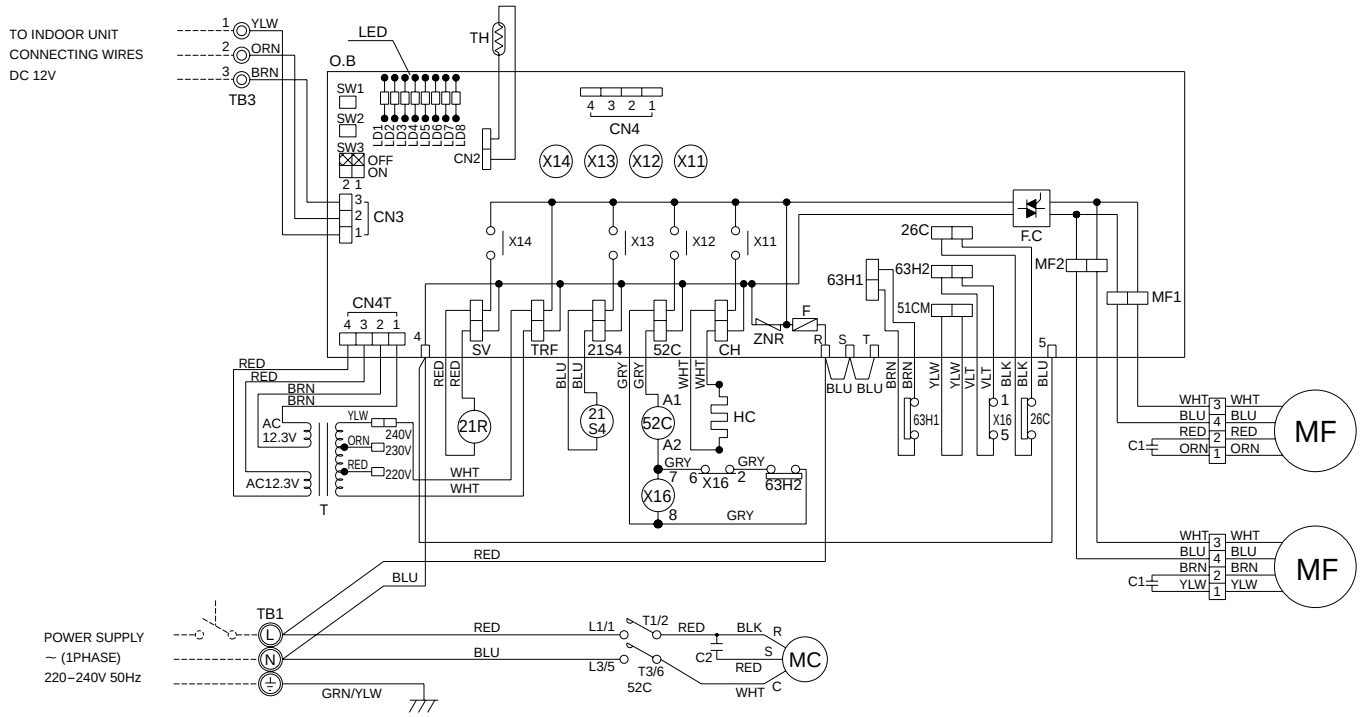
Unit : mm (inch)



5 WIRING DIAGRAM

PUH-4VKSA·UK

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
CN3<O.B>	CONNECTOR(CONNECTING WIRES INDOOR/OUTDOOR)	MC	COMPRESSOR	X12<O.B>	COMPRESSOR RELAY
		MF	FAN MOTOR	X13<O.B>	SOLENOID COIL RELAY
CN4T<O.B>	CONNECTOR(TRANSFORMER)	O.B	OUTDOOR CONTROLLER BOARD	X14<O.B>	SOLENOID COIL RELAY
HC	CRANKCASE HEATER	21R	SOLENOID COIL(BYPASS VALVE)	X16	HIGH PRESSURE RELAY
C1	FAN MOTOR CAPACITOR	SW1·2·3<O.B>	SELECT SWITCH(CHECK,SERVICE)	ZNR<O.B>	SURGE ABSORBER
C2	COMPRESSOR CAPACITOR	T	TRANSFORMER	21S4	4-WAY VALVE SOLENOID COIL
FC<O.B>	FAN CONTROLLER	TB1,3	TERMINAL BLOCK	52C	COMPRESSOR CONTACTOR
F<O.B>	FUSE(6A)	TH	OUTDOOR COIL THERMISTOR	63H1	CONTROL HIGH PRESSURE SWITCH
LD1-LD8<O.B>	LED(CHECK,SERVICE)	X11<O.B>	CRANKCASE HEATER RELAY	63H2	PROTECT HIGH PRESSURE SWITCH
26C	DISCHARGE PIPE THERMOSTAT	⏚	EARTH		



Main functions of LED (when both No.1 and No.2 of SW3 are "OFF")

LED No.	Output Display (light)	Check Display (flashing)
LD1	Compressor indoor command	——
LD2	Heating indoor command	——
LD3	63H1 ON	Pipe sensor short/open
LD4	Compressor ON	63H2 functions
LD5	Outdoor fan ON	——
LD6	4-way valve ON	26C Overheat protection
LD7	Bypass valve ON	TH overheat protection
LD8	Crankcase heater ON	Defective input

How to use SW1 and SW2

- Pressing SW1 erases the past check contents stored on the microcomputer.
- The output display (light) remains during operation but pressing SW2 displays the past check contents in flashing mode. Pressing the switch again returns to output display(light).

NOTE: If the operation of the protection device stops to function, then check the display flashes.

CAUTION FOR SERVICING

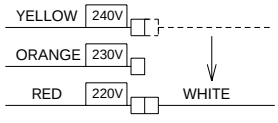
- Connect the lead wires according to the colour indication of the sticker on the compressor terminal.

CAUTIONS FOR POWER SUPPLY WIRING

- Since LD8 lights when normal power is turned "ON", check the power supply with the ON or OFF LD8.

※ Since the outdoor transformer (T) is connected with 240V power, if 220V or 230V power is used, change the wiring connections according to the following procedure.

※ When Power Supply is 220V



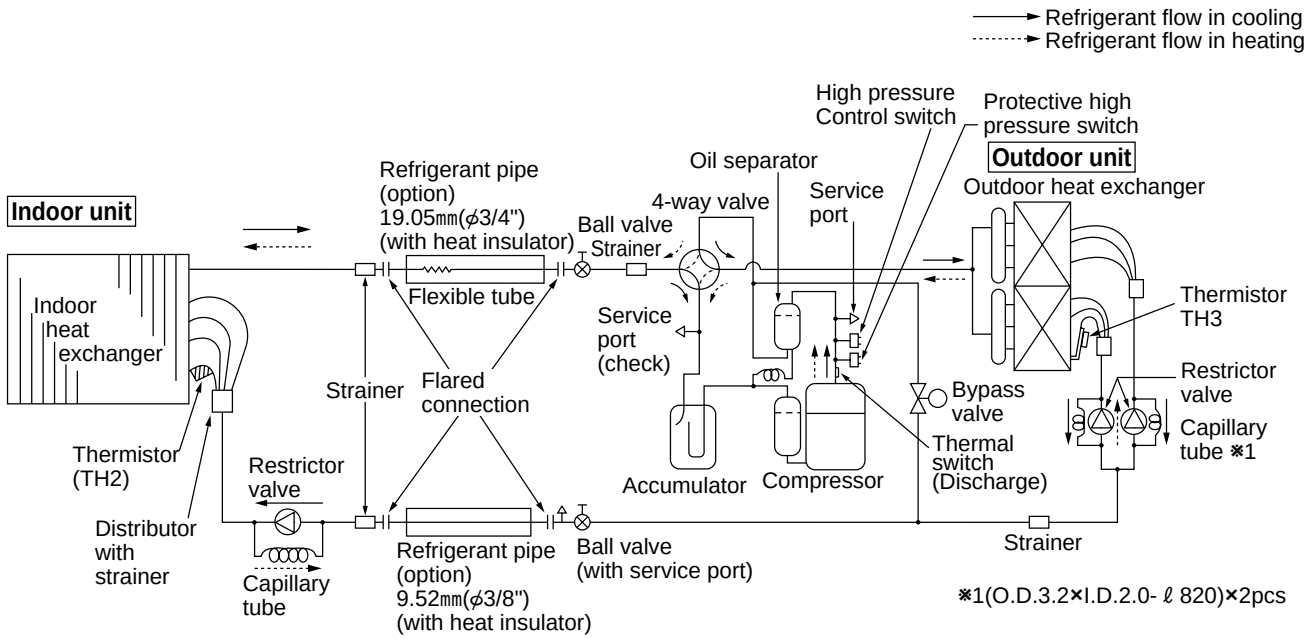
CAUTION FOR INDOOR AND OUTDOOR CONNECTING WIRES

- Since the indoor and outdoor connecting wires have polarity,make sure to connect the same terminal numbers(1,2,3)for indoor and outdoor units.

6 REFRIGERANT SYSTEM DIAGRAM

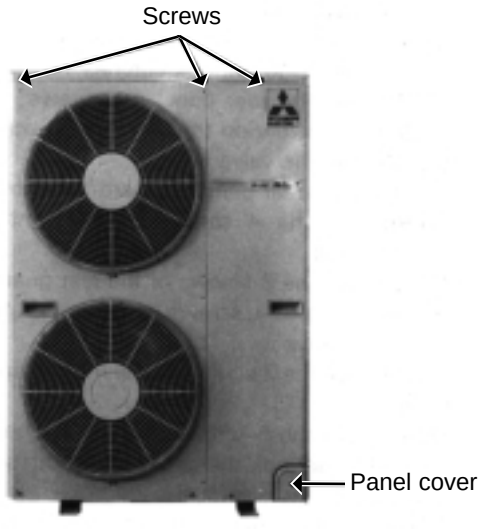
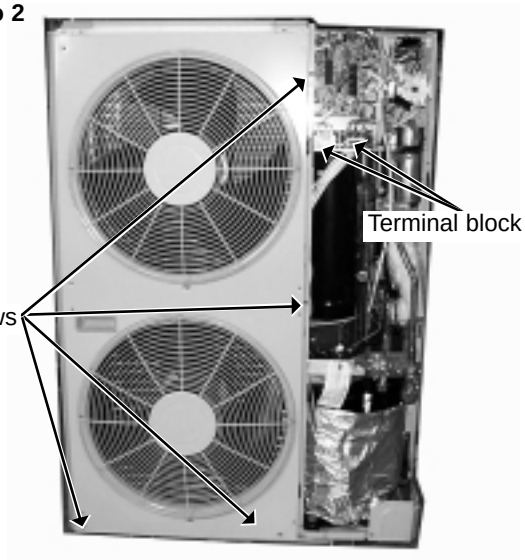
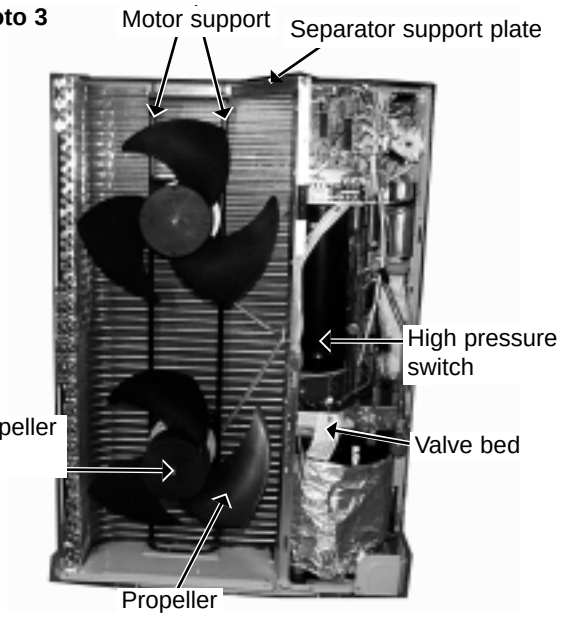
PUH-4VKSA·UK

Unit : mm



7 DISASSEMBLY PROCEDURE

PUH-4VKSA·UK

OPERATING PROCEDURE	PHOTOS
1. Removing the electrical parts (1) Remove the 3 screws at the front and 2 screws at the rear of the top panel. (2) Remove the top panel. (3) Remove the screw from the panel cover. Unhook the catches from the side panel and pull the panel cover toward you to remove. (4) Remove the screw from the service panel. Pull down the service panel to unhook the catches. Pull the service panel toward you to remove.	**Photo 1**  **Photo 2** 
2. Removing the fan motors (1) Remove the 3 screws and the front panel. Open the panel to a 45-degree angle and lift it to remove. The panel is hooked by 3 catches on the left side. (2) Remove the propeller nuts and the propellers. (3) Remove the 3 screws each and the fan motors. Disconnect the lead connectors.	**Photo 3** 

OPERATING PROCEDURE

3. Removing the heat exchanger and the compressor

NOTE : When removing the panels, move them up and down to unhook catches.

(1) Remove the rear panel set screws : 2 screws at the front, 1 screw on the side, and 3 screws at the rear.
(2) Remove the valve bed.
(3) Open the rear panel rearward to remove.
(4) Remove the 4 screws of the right side panel and remove it.
(5) Remove the 3 screws of the rear guard and remove it.
(6) Remove the 4screws of the separator support plate and remove it.
(7) Remove the 2 screws of the motor support and remove it.
(8) Remove the 5 screws of the valve bed. Lift the valve bed to unhook the catches on both sides.
(9) Remove the electrical parts box.
(10) Disconnect the connectors of the high-pressure switch, crankcase heater, shell thermo, and fan motor.
(11) Remove the 2 screws of the separator and remove it.
(12) Remove the 2 screws of the heat exchanger and remove it.
(13) Detach the brazed points of the pipe.
(14) Remove the 3 nuts of the compressor and remove it.
(15) Detach the welded points of the suction pipe and discharge pipe.

PHOTOS

Photo 4

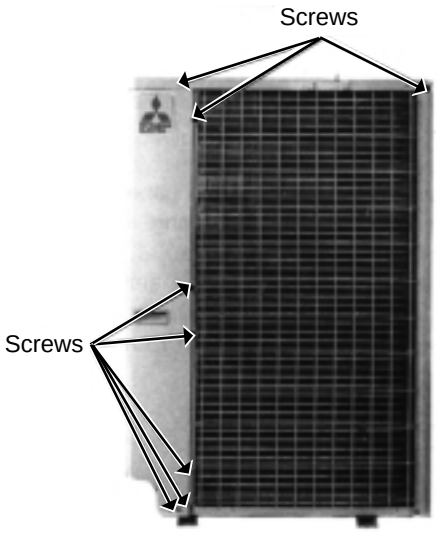
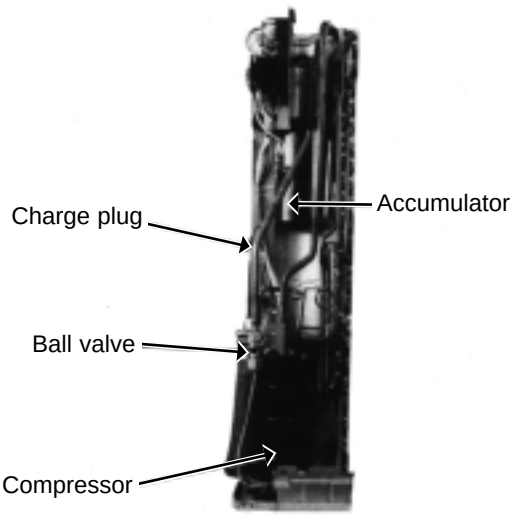


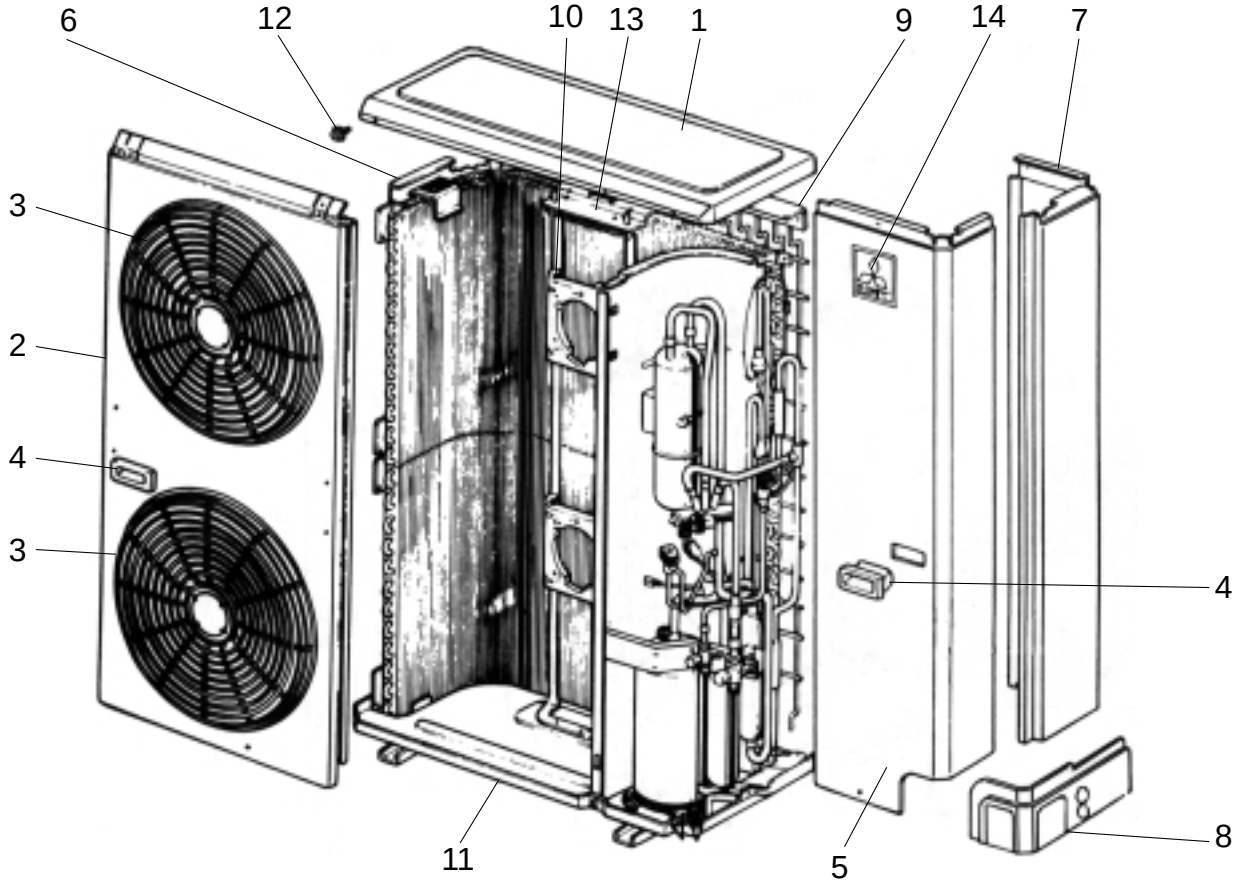
Photo 5

Photo 6



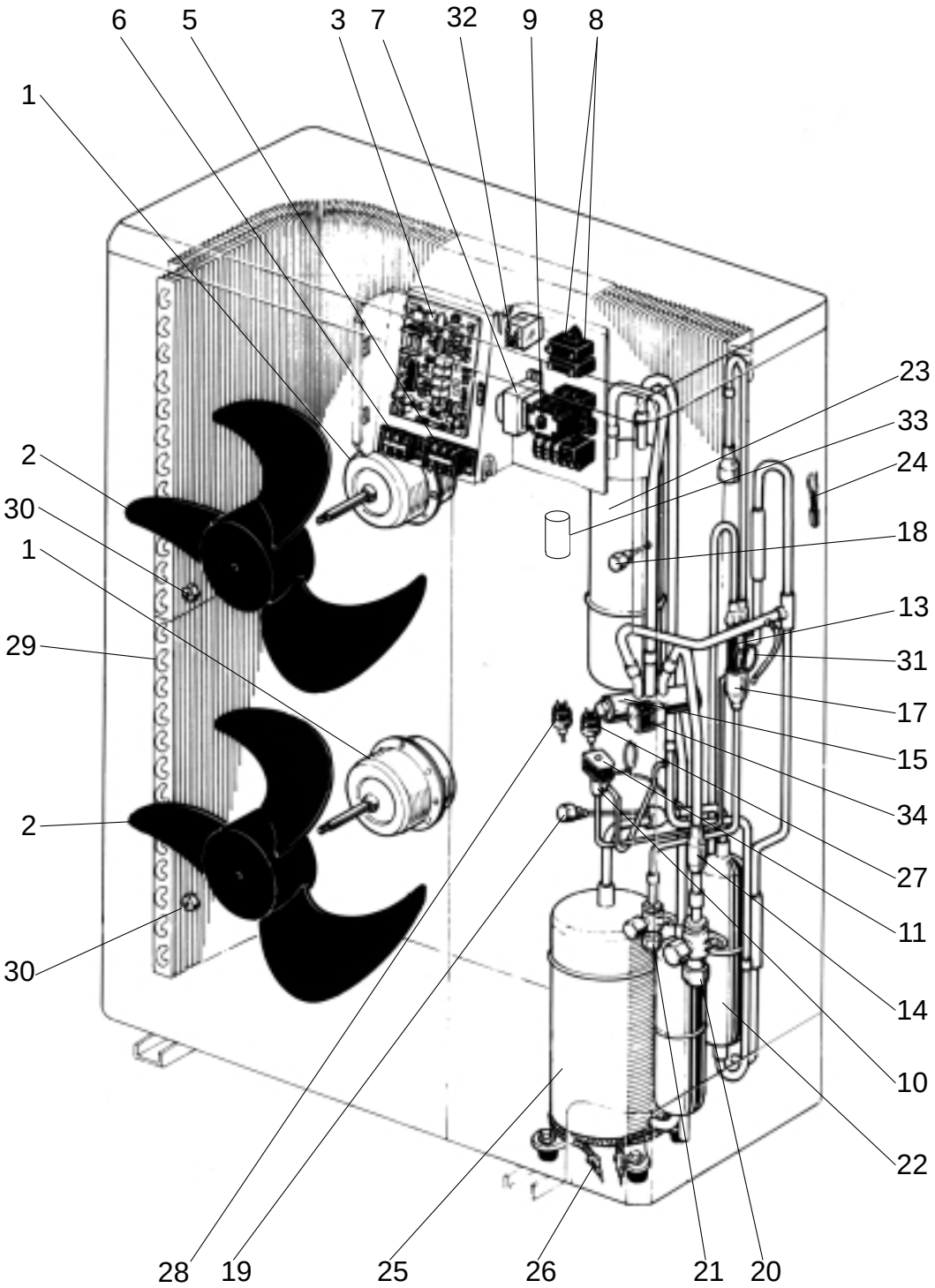
8 PARTS LIST

STRUCTURAL PARTS
PUH-4VKSA·UK



No.	Part No.	Part name	Specification	Q'ty/set PUH-4 VKSA.UK	Remarks	Wiring Diagram Symbol	Recommended Q'ty	Price Unit	Price Amount
1	S70 020 641	TOP PANEL		1					
2	S70 004 668	FRONT PANEL		1					
3	S70 001 675	FAN GUARD		2					
4	S70 A00 655	PANEL HANDLE		3					
5	S70 004 661	SERVICE PANEL		1					
6	S70 040 662	SIDE PANEL		1					
7	S70 040 682	REAR PANEL		1					
8	S70 020 658	PANEL COVER		1					
9	S70 040 698	REAR GUARD		1					
10	S70 050 130	MOTOR SUPPORT		1					
11	S70 001 686	BASE		1					
12	–	F.ST SCREW		13	(Z004M203H10)				
13	–	MOTOR PLATE		1	(BG00G231G01)				
14	–	LABEL(MITSUBISHI)		1	(BC79G510H01)				

FUNCTIONAL PARTS
PUH-4VKSA·UK



Part numbers that are circled are not shown in the figure.

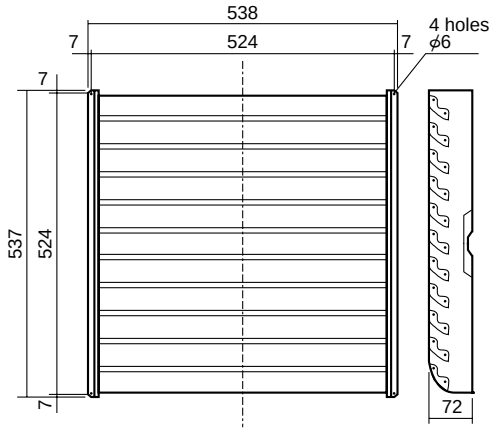
No.	Part No.	Part name	Specification	Q'ty/set	Remarks	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PUH-4 VKSA.UK				Unit	Amount
1	S70 040 763	FAN MOTOR	PN6V60-UA	2		MF			
2	S70 001 115	PROPELLER		2					
3	S70 A04 315	OUTDOOR CONTROLLER BOARD		1		O.B			
④	S70 A01 529	D.P ASSY		1					
5	S70 509 716	TERMINAL BLOCK	3P(L,N,⏚)	1		TB1			
6	S70 516 716	TERMINAL BLOCK	3P(1,2,3)	1		TB3			
7	S70 106 799	TRANSFORMER		1		T			
8	S70 39J 255	FAN MOTOR CAPACITOR	4μF 440V	2		C1			
9	S70 956 708	COMPRESSOR CONTACTOR	S-N35	1		52C			
10	S70 272 428	SOLENOID VALVE		1					
11	S70 106 242	SOLENOID COIL		1		21R			
⑫	S70 A00 425	CAPILLARY TUBE	ϕ3.2×ϕ2.0×820mm	2					
13	S70 993 418	RESTRICTOR VALVE		2					
14	S70 42L 450	STRAINER		1					
15	S70 260 403	4-WAY VALVE		1					
⑯	S70 A02 201	DISCHARGE PIPE THERMOSTAT		1		26C			
17	S70 A11 450	STRAINER		1					
18	S70 943 413	CHARGE PLUG		1					
19	S70 A01 413	CHARGE PLUG		1					
20	S70 670 411	BALL VALVE	3/4"	1					
21	S70 943 410	BALL VALVE	3/8"	1					
22	S70 A14 490	OIL SEPARATOR		1					
23	S70 A12 440	ACCUMULATOR		1					
24	S70 A00 202	OUTDOOR COIL THERMISTOR		1		TH			
25	S70 610 300	COMPRESSOR	NH-56VNDT	1		MC			
26	S70 A02 236	CRANKCASE HEATER	240V 38W	1		HC			
27	S70 A00 208	CONTROL HIGH PRESSURE SWITCH	OFF 2.55MPa ON 2.1MPa	1		63H1			
28	S70 A04 208	PROTECT HIGH PRESSURE SWITCH	OFF 3.3MPa ON 2.1MPa	1		63H2			
29	S70 012 408	OUTDOOR HEAT EXCHANGER		2					
30	S70 30L 097	NUT	M8	2					
31	S07 113 425	CAPILLARY TUBE	ϕ2.5×ϕ0.6×1000mm	1					
32	S70 737 215	HIGH PRESSURE RELAY	LY-2F 230V 10A	1		X16			
33	S70 040 723	COMPRESSOR CAPACITOR	60μF 450V	1		C2			
34	S70 A00 242	4WAY COIL		1					

9 OPTIONAL PARTS

AIR OUTLET GUIDE

This guide is for changing the outdoor unit air discharge direction. For PUH-4/5/6 type, 2 sets of PAC-292SG are needed.

Part No.	PAC-292SG (1 pc/set)
Applied Service	PUH-1.6~6K(S)A type



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